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RADIOCOMMUNICATIONS AND
SEARCH AND RESCUE
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SATELLITE SERVICES (Inmarsat and COSPAS-SARSAT)

Review of resolution A.888(21)

Report of the Correspondence Group

Submitted by the International Mobile Satellite Organization (IMSO) as the Co-ordinator of the Correspondence Group

SUMMARY

<i>Executive summary:</i>	This document reports the outcome of the Correspondence Group on the review of resolution A.888(21) and proposes a revised text of the resolution. The revised text has been co-ordinated with the text of a draft Reference Public Services Agreement (PSA) being developed concurrently by IMSO.
<i>Action to be taken:</i>	Paragraph 16
<i>Related documents:</i>	COMSAR 9/9, paragraphs 5.12 to 5.16 and annex 9; MSC 79/23; MSC/Circ.1077; and resolution A.888(21)

GENERAL

1 At its ninth session, 7–11 February 2005, the Sub-Committee decided to establish a Correspondence Group to review and develop a revised text of resolution A.888(21), *Criteria for the Provision of Mobile-Satellite Communication Systems in the Global Maritime Distress And Safety System (GMDSS)*, (COMSAR 9/19, paragraphs 5.12 to 5.16 and annex 9). The Correspondence Group was co-ordinated by Mr. A. Fuller (IMSO). The following Administrations participated in the work of the Correspondence Group:

AUSTRALIA
DENMARK
FRANCE
JAPAN
MARSHALL ISLANDS

POLAND
RUSSIAN FEDERATION
SWEDEN
UNITED KINGDOM
UNITED STATES

and observers from the following governmental and non-governmental organizations also participated:

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WORLD METEOROLOGICAL ORGANIZATION (WMO)
INTERNATIONAL MOBILE SATELLITE ORGANIZATION (IMSO)
INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)

TERMS OF REFERENCE

2 COMSAR 9 agreed to the following Terms of Reference for the Correspondence Group; such as, to:

- .1 consider the submissions by IMSO (COMSAR 9/5/1), the United States (COMSAR 9/5/2), Denmark and Liberia (COMSAR 9/5/3) and the report of the Maritime Safety Committee at its seventy-ninth session (MSC 79/23);
- .2 invite participation, through their national delegations, by potential providers of mobile-satellite services for the GMDSS;
- .3 review resolution A.888(21) in the light of events that have occurred since its adoption;
- .4 provide a draft of the resolution suitable for approval by COMSAR 10;
- .5 incorporate in the draft resolution a complete, expeditious and effective procedure for the evaluation, recognition and oversight of new satellite providers; and
- .6 co-ordinate its work with IMSO.

3 In accordance with item 2 of its Terms of Reference, representatives of the following satellite communications companies also contributed to the work of the Correspondence Group, through their national delegations, as potential providers of mobile-satellite services for the GMDSS:

Inmarsat
IRIDIUM

MOBILE SATELLITE VENTURES (MSV)
ORBCOMM

WORK OF THE CORRESPONDENCE GROUP

4 Taking account of the discussions that had already taken place at MSC 79 and COMSAR 9, the Correspondence Group decided to focus its work on the development of a draft revision of resolution A.888(21).

Co-ordination with IMSO

5 Throughout its work, the Correspondence Group was informed of parallel work being undertaken in IMSO to develop a new draft Reference Public Service Agreement (Reference PSA). IMSO was similarly kept informed of the deliberations of the Correspondence Group, and the text of both draft documents progressed in parallel. This was considered vital because the two documents will need to act in combination to establish the “*complete, effective and expeditious procedure for the evaluation, recognition and oversight of new satellite providers*” envisaged by COMSAR in item 5 of the Correspondence Group’s Terms of Reference. The

Correspondence Group understands that IMSO has completed its work on the text of the draft Reference PSA, which will now be submitted to the IMSO Assembly of Parties for approval, and that IMSO intends to submit the draft reference PSA as an information paper to COMSAR 10, to inform the Sub-Committee's consideration of resolution A.888(21).

Responsibilities of IMO and IMSO

6 In order to establish the new procedure for the evaluation, recognition and oversight of new satellite providers, it was necessary for the Correspondence Group to consider first what functions would be needed in carrying out such a procedure and how IMO and IMSO should allocate those functions between them. The Correspondence Group sought and received informal advice from a range of sources, which can be summarized as follows:

- .1 so far as is possible, it is essential to isolate IMO from any liability arising from decisions that may be taken by the Organization in relation to the participation by commercial satcom providers in the GMDSS, and in relation to the future LRIT system;
- .2 it is equally important to retain a proper role for the MSC in GMDSS regulation and the approval processes that flow from it;
- .3 the preferred regime is one that will involve the MSC in a general way at the very beginning of an application to participate in the GMDSS, but makes a clear and clean break between the organizations immediately after that point in the process. This results in the following general procedure:
 - (a) IMO establishes the regulatory regime, via the revision of resolution A.888, which states that IMSO evaluates and approves satcom companies to participate in the GMDSS, undertakes the oversight on a continuing basis and keeps IMO (MSC) informed;
 - (b) the Company applies - through its Government - to IMO. The application is reviewed by the MSC - which has a general discussion of principles and policy issues only - and forwards the application to IMSO; and
 - (c) IMSO verifies the information provided and evaluates the application (the process is open and transparent with IMO and the sponsoring Government involved as Observers), decides on the acceptability of the applicant (based on criteria established by IMO in the revised resolution A.888) and, if appropriate, recognizes the applicant's services and conducts ongoing oversight. IMSO is also responsible for ensuring compliance - including any resulting enforcement procedures; and
- .4 this procedure offers a clean and defensible break between IMO and IMSO at the point between 6.3(b) and 6.3(c) above, while providing the MSC with an ongoing role at the policy level. This extends into the future generic regime the current practice in relation to the oversight of Inmarsat.

7 The Correspondence Group achieved a very broad agreement in support of this approach, and some governments have already expressed their official support in IMSO for the proposed division of responsibility between IMO and IMSO. However, two countries were not able to fully agree this approach within the discussions of the Correspondence Group.

Maritime Safety Information

8 A number of countries raised the issue of Maritime Safety Information (MSI) broadcasting in a multi-provider regime. The present arrangements for co-ordinating and broadcasting MSI were developed in the late '70s and early '80s in direct co-operation with Inmarsat, to the extent that the Inmarsat-C SafetyNET broadcast and reception capabilities were largely designed to meet operational requirements stated explicitly by the MSI community in IMO, WMO and IHO.

9 To try to get an understanding of what the needs of that community are today, the Co-ordinator of the Correspondence Group attended a meeting of the International Hydrographic Organization's Commission on Promulgation of Radio Navigational Warnings (CPRNW) in Monaco during September 2005. That session was attended by many of the NAVAREA Co-ordinators and also by the Chairman of the World Meteorological Organization's (WMO) Expert Team on Maritime Safety Services (ETMSS). The Commission has not yet reached a final conclusion on this issue, but the meeting expressed the clear view that the facilities provided today by the International SafetyNET service represent the minimum operational capability that the Navigational Warning and Meteorological Message Co-ordinators need, and they would insist that these facilities were also provided by any other satellite service that may be approved to participate in the GMDSS in future. At the same time, they expressed a desire to be able to broadcast more data to ships through the medium of higher data speeds than are provided by Inmarsat-C today.

10 In particular, the CPRNW stated that the key features they regard as essential include:

- .1 the ability to address messages to fixed areas (i.e. NAV/MET AREAs), geographically defined areas and entire ocean areas (they described these in terms of the present Inmarsat satellite footprints);
- .2 the ability to automatically schedule a message for broadcast at a particular time, and direct that it be repeated automatically thereafter;
- .3 the ability to cancel messages at any time, or at some pre-defined time in the future;
- .4 the ability to assign different priorities to different messages;
- .5 they stressed the vital importance of the mobile terminal being able to reject messages that are not required on board that particular ship, at the instruction of the operator;
- .6 they also regard it as essential for safety that a ship should be able to program its receiver to print out messages for the next area she is due to enter, in addition to those for the area she is currently sailing in;
- .7 it is important that proper and adequate contingency plans are made to cover all possible breakdowns within the satellite network; and
- .8 Information Providers need to be able to monitor their broadcasts to ensure proper control of the information they provide to ships.

11 The Navigational Warning and Meteorological Message Co-ordinators represented in the CPRNW also expressed their concerns about the possible multiplication in their operational effort and broadcast costs if they are required to input messages into multiple systems. They considered the possibility of establishing a central server to handle this on their behalf, so that their costs for distributing messages could be contained at more-or-less the present level and the control of information flow simplified, but were unable to reach a conclusion on this idea at this time. They recognized that there would be a cost for establishing and maintaining such a server, which they would probably have to pay themselves, and there would also be costs associated with their responsibility for monitoring transmissions (resolution A.706(17), paragraph 6.2.1.15) from, potentially, several different systems.

12 There are clearly some questions that will need to be resolved in the future in relation to MSI broadcasts. However, it is plainly too early to reach resolution on them at this time, and the Correspondence Group believes that they will eventually be answered in the context of a wider review of maritime safety information services. It is likely that Sub-Committee will need to re-visit this issue at that time. The Correspondence Group has therefore drafted the proposed new text in terms of current operational requirements and capabilities.

Functional requirements

13 This leads to one particular question that needs to be resolved: should every provider of satellite services for the GMDSS have to provide all the SOLAS functional requirements (including distress alerting and MSI broadcasting)? An overwhelming majority in the Correspondence Group is clearly in favour of answering “yes” to this question. Indeed, it is difficult to understand how the interests of fair competition could be met in any other way while continuing to assure the maritime community of high-quality distress and safety services. It has been suggested that perhaps Inmarsat could be paid in some way to provide those non-commercial services. It was not clear to the Group what mechanism could be put in place to achieve this, nor was it clear how fair competition could result from an environment in which Inmarsat’s terminals were mandated for carriage in ships for that purpose when others were not. The Correspondence Group therefore concluded that every system should provide every SOLAS function, and this has been reflected in the proposed text.

Distress communications

14 Some members of the Group expressed concern about the implications, both cost and operational, of a multi-provider regime on distress communication routing. The Correspondence Group could not come up with any definite proposals on this issue and the proposed text reflects the best that can be achieved for the time being. The Sub-Committee may need to re-visit this issue when the capabilities of other providers become more clear and some operational experience of the multi-provider environment has been gained.

RECOMMENDATION

15 Resolutions of the IMO Assembly are, by definition, recommendatory in nature. The Organization therefore adopts the practice of using “should” rather than “shall” in such documents. However, the Correspondence Group believes that many of the recommendations included in the proposed new text of the resolution should in fact be made mandatory. This could be achieved through the incorporation of the proposed resolution into the requirements of the IMSO Reference PSA, which would impose a contractual obligation on the provider. However, it would be much better if that contractual obligation were to be supported and

reinforced by a direct reference in the SOLAS Convention. The Correspondence Group therefore recommends that the Sub-Committee requests the Committee to consider strengthening the force of this resolution by incorporating a reference to it in the SOLAS Convention.

ACTIONS REQUESTED OF THE SUB-COMMITTEE

16 The Sub-Committee is invited to:

- .1 note the active participation, through their national delegations, by potential providers of mobile-satellite services for the GMDSS (paragraph 2.2);
- .2 note the continued co-ordination with IMSO throughout the work of the Correspondence Group (paragraph 2.6);
- .3 endorse the Correspondence Group's decision to adopt the "clean break" principle in relation to the functions to be carried out by IMO and IMSO in the procedure for the evaluation, recognition and oversight of new satellite providers (paragraphs 6 and 7);
- .4 note the advice received from the Navigational Warning and Meteorological Message Co-ordinators in relation to maritime safety information (MSI) broadcast facilities, and the conclusions of the Correspondence Group in that regard (paragraphs 8 to 12);
- .5 endorse the recommendation of the Correspondence Group that every system should provide every SOLAS function (paragraph 13);
- .6 note the concern expressed by the Correspondence Group about the implications, both cost and operational, of a multi-provider regime on distress communication routing, and the opinion of the Group that the Sub-Committee may need to re-visit this issue when the capabilities of other providers become more clear (paragraph 14);
- .7 request the Committee to consider strengthening the force of the proposed resolution by incorporating a reference to it in the SOLAS Convention (paragraph 15);
- .8 decide that the proposed draft resolution incorporates "... a complete, expeditious and effective procedure for the evaluation, recognition and oversight of new satellite providers" (paragraph 2.5); and
- .9 consider the text of the annexed draft resolution and forward it to the Committee for approval.

ANNEX

PROPOSED DRAFT AMENDMENTS

to

IMO RESOLUTION A.888(21) [...]

adopted on [date]

**CRITERIA FOR THE PROVISION OF MOBILE-SATELLITE
COMMUNICATION SYSTEMS IN THE GLOBAL MARITIME
DISTRESS AND SAFETY SYSTEM (GMDSS)**

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention of the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO that regulation IV/5 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended in 1988, requires each Contracting Government to undertake to make available, either individually or in co-operation with other Contracting Governments, as they may deem practical and necessary, appropriate shore-based facilities for space and terrestrial radiocommunication services having due regard to the recommendations of the Organization,

TAKING INTO ACCOUNT resolution 322(Rev.Mob-87) of the World Administrative Radio Conference, 1987, relating to coast stations and coast earth stations assuming watchkeeping responsibilities on certain frequencies in connection with the implementation of distress and safety communications for the GMDSS,

TAKING INTO ACCOUNT ALSO resolution 3, Recommendation on the Early Introduction of the Global Maritime Distress and Safety System (GMDSS) Elements, adopted by the 1988 SOLAS Conference introducing the GMDSS,

NOTING resolution A.801(19) on the Provision of radio services for the GMDSS, as amended,

~~NOTING ALSO developments within the field of mobile-satellite communications,~~

NOTING FURTHER ALSO that future mobile-satellite communication systems might have the potential to offer maritime distress and safety communications,

NOTING FURTHER the decision of the Maritime Safety Committee at its seventy-ninth session that the International Mobile Satellite Organization (IMSO) is the appropriate organization to carry out the required oversight of mobile-satellite services for the GMDSS;

CONSIDERING RECOGNIZING that mobile-satellite communication systems for use in the GMDSS should fulfil performance criteria adopted by the Organization,

~~RECOGNIZING that the Inmarsat system at present is the only mobile-satellite communication system recognized by SOLAS Contracting Governments for use in the GMDSS;~~

RECOGNIZING ALSO the need for the Organization to have in place criteria against which ~~to evaluate the capabilities and performance; of mobile-satellite communication systems; as may be notified to the Organization by Governments for possible recognition for use in the GMDSS~~ may be verified and evaluated;

1. ADOPTS the Criteria for the Provision of Mobile-Satellite Communication Systems in the GMDSS set out in the Annex to the present resolution;

2. INVITES Governments, when permitting ships flying their countries' flag ~~to carry maritime mobile-satellite equipment for use in the GMDSS to require those ships to carry equipment which can utilize recognized regional~~ only those satellite systems that have been recognized by IMSO and conform to the Performance Standards adopted by the Organization for use in the GMDSS, in accordance with ~~on a national or regional basis, to apply~~ the criteria set out in sections 2 to 5 of the Annex;

3. ~~INVITES ALSO REQUESTS the~~ IMSO Maritime Safety Committee to:

- (a) apply the criteria set out in the Annex to the present resolution, ~~via in particular the procedure set out in section 42 of the Annex, for the evaluation of when evaluating mobile-satellite communication satellite systems notified by Governments for possible recognition for use in the GMDSS, within the context of the and to consider, in connection with decisions thereon, the provisions of relevant regulations of SOLAS chapter IV; and~~
- (b) ensure that, ~~for mobile-satellite communication systems to be recognized by the Organization for use in the GMDSS, they should be~~ are compatible with all appropriate SOLAS requirements, and also that ~~any such recognition should not result in substantial changes having to be made to~~ takes into account existing operational procedures and equipment performance standards; ~~and.~~

4. REQUESTS the Maritime Safety Committee to ~~(e)~~ keep this resolution under review and take appropriate action as necessary to secure the long-term integrity of the GMDSS.

ANNEX

CRITERIA FOR THE PROVISION OF MOBILE-SATELLITE COMMUNICATION SYSTEMS IN THE GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

1 ~~GENERAL~~ 2 DEFINITIONS

1.1 Mobile-Satellite Communication System

The **mobile-satellite communication system** (satellite system) means the space segment, the arrangements for controlling the space segment, and the network control facilities controlling the access to the space segment, the earth stations and maritime mobile terminals operating in the system. The satellite system will include, or interface with, the following elements:

- .1 **Earth station** means any fixed satellite communication station acting as a gateway between the space segment and the terrestrial networks.
- .2 **Maritime mobile terminal** means any radiocommunication equipment working through a satellite communication system recognized for use in the GMDSS on board a ship.
- .3 **Space segment** means the satellites and the radiocommunication facilities they carry both for control and to provide GMDSS services and includes the forward and return communication links with the earth..
- .4 **Terrestrial networks** means the communication networks providing land-based subscriber communication facilities such as telephone, facsimile or data communications.

1.2 Mobile-Satellite Communication Service means any service which operates through a satellite system and is recognized by IMSO for use in the GMDSS.

~~2.2~~1.3 Coverage area

The ~~e~~**Coverage a**Area of the satellite system is the geographical area within which the satellite system provides an availability in accordance with the criteria stated in section 3.5 in the ship-to-shore and shore-to-ship directions, and within which continuous alerting is available. This should be described in relation to any of the sea areas as defined in the SOLAS Convention, i.e. Sea Area A4 is an area outside sea areas A1, A2 and A3; Sea Area A3 is within the coverage of an Inmarsat geostationary satellite in which continuous alerting is available, excluding Sea Areas A1 and A2; Sea Area A2 is within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available; and Sea Area A1 is within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available.

2.3.1.4 Availability

~~2.3.1~~ The availability of a ~~any mobile-satellite~~ communication system ~~or service~~ is defined as the percentage of time in which the system or service as a whole is available for access to and communications through the system, ~~i.e.~~ calculated according to the following formula:

$$A = \frac{(\text{scheduled operating time}) - (\text{downtime})}{(\text{scheduled operating time})} \times 100\%$$

where:

<i>Scheduled operating time</i>	= 100% of the time period being reported on; and
<i>Downtime</i>	= the total time during the period for which the recognized GMDSS system or service was not operationally available.

~~2.3.2~~ **Note:** Definitions and calculations of availabilities of communications circuits in the Maritime Mobile-Satellite Service are given in ITU-R M.828-1.

2 RECOGNITION OF MOBILE-SATELLITE COMMUNICATION SYSTEMS FOR USE IN THE GMDSS

2.1 The evaluation, recognition and continuing oversight of satellite systems participating, or wishing to participate in the GMDSS is undertaken by IMSO.

2.2 Application for Recognition

~~1.1.2.2.1~~ Mobile-satellite communication systems ~~presented~~ providers wishing to participate in the GMDSS should apply to the Organization, through a Member State, for ~~evaluation and possible~~ recognition as a radio system providing the maritime distress and safety satellite communication capabilities necessary for use in the GMDSS. Such applications should be notified to the Organization by Governments, either individually or in co-operation with other Governments. The application will be reviewed by the Maritime Safety Committee (MSC) in relation to its policy for the expansion of satellite services in the GMDSS. If the MSC decides that there are no objections in principle to the application, it will forward the application to IMSO for evaluation and possible recognition.

~~2.2.2~~ The Governments concerned should make available to ~~the Organization~~ IMSO all necessary information ~~relevant~~ to enable it to evaluate the satellite system in relation to the criteria indicated below, ~~including proof of availability obtained in the mobile-satellite system concerned.~~

~~1.2~~ Governments desiring, individually or in co-operation with other Governments within a specific SAR area, to provide coast earth station facilities for serving the GMDSS in particular areas as part of a recognized system, should notify the Organization as to the extent of continuous coverage and the extent of coverage from shore. This information should be determined by Governments in accordance with the criteria indicated below.

~~1.3~~ In particular, Governments proposing such ~~mobile satellite communication~~ systems for possible recognition and use in the GMDSS should ~~ensure~~ provide evidence to show that:

- ~~1~~ these ~~mobile-satellite communication~~ systems conforms with all the criteria specified in this Annex;
- ~~2~~ ~~only those systems are notified to the Organization for evaluation and possible recognition for use in the GMDSS; and~~
- ~~3~~ the ~~charging policies and~~ provisions of resolution A.707(17), ~~as amended~~, on Charges for distress, urgency and safety messages through the Inmarsat system, are complied with; ~~and~~
- ~~3~~ there is a well-founded confidence that the Company concerned will remain viable for the foreseeable future and will remain in a position to deliver the required services over an extended period in keeping with the expectations of the Organization and the maritime industry on the continuity, durability and reliability of the service; and
- ~~4~~ the provider of the satellite system is ready to submit any recognized services to oversight by IMSO and sign the required Public Services Agreement (PSA) with that organization.

2.3 Verification and Evaluation

~~1.4~~ Notifications of ~~mobile-satellite communication~~ systems proposed for evaluation and possible recognition for use in the GMDSS should be evaluated by the Maritime Safety Committee relative to the criteria specified in this Annex. Based on the results of the detailed evaluation, the Maritime Safety Committee will decide as appropriate, taking into account the provisions of the relevant regulations of chapter IV of the 1974 SOLAS Convention, as amended.

2.3.1 IMSO should verify and evaluate the information, seeking advice from an independent Group of Experts convened for the purpose and clarification as required direct from the service provider concerned, and decide whether the satellite system meets the criteria established by in this resolution. In reaching its decision, IMSO should take into account the provisions of the relevant regulations of chapter IV of the 1974 SOLAS Convention, as amended and the criteria established by this resolution.

2.3.2 Recognition by IMSO should be recorded in a Notice of Recognition which states, *inter alia*, the name and address of the company providing the services. A copy of the Letter of Recognition should be provided to the Organization for information.

2.3.3 If, following evaluation, IMSO is unable to recognize the Company or the service(s) offered for the GMDSS, IMSO should communicate this decision to the Company and the Organization in writing, setting out the reasons for the decision and any actions the Company may take to achieve recognition in the future.

2.4 The Public Services Agreement

2.4.1 Recognized services are subject to oversight by IMSO according to the rules and arrangements set out in the Public Services Agreement (PSA) concluded between the Service

Provider and IMSO. No maritime satellite system should be used in the GMDSS unless it has first been recognized by IMSO in accordance with the above procedure and the Service Provider has signed a Public Services Agreement with IMSO.

2.4.2 IMSO should conduct its oversight of the recognized services on a continuing basis.

2.4.3 Responsibility for ensuring compliance with the standards established by this annex, other relevant mandatory international instruments and, to the extent necessary, those recommendations, resolutions and procedures of IMO and ITU which are of a recommendatory nature, insofar as they relate to the provision of GMDSS services, rests with IMSO under the terms of the Public Services Agreement.

2.5 Reports

~~1.5 Governments providing mobile satellite communication systems recognized by the Organization for use in the GMDSS should, either individually or in co-operation with other Governments, ensure that these systems continue to conform to the criteria specified in this Annex and IMSO should, at least once a year, make available to the Organization for evaluation a report on the availability, and performance obtained and other relevant information concerning each recognized service during the period since the preceding report in accordance with section 3.5.2 of the criteria indicated below. The Maritime Safety Committee should evaluate such reports relative to the criteria specified in this Annex and take action as appropriate.~~

~~2.5.2 The Organization should include and maintain in the GMDSS Master Plan details of all areas covered by mobile satellite communication systems recognized for use in the GMDSS and of all areas covered by individual coast earth stations operating in those systems recognized as serving the GMDSS. The Organization should periodically circulate an updated copy of the description of these systems and areas to Governments.~~

3 CRITERIA AND REQUIREMENTS FOR THE RECOGNIZED MOBILE-SATELLITE COMMUNICATION SYSTEM

3.1 Functional requirements*

~~3.1.1 Mobile sSatellite communication systems for maritime distress and safety communication services and forming part of the GMDSS radio systems specified in chapter IV, regulation 5 of the 1974 SOLAS Convention, as amended, should be capable of processing provide capabilities for~~ at least the following maritime distress and safety communications:

- .1 ship-to-shore distress alerts/calls;

* - Resolution A.801(19) "Provision of Radio Services for the Global Maritime Distress and Safety System (GMDSS)", Annex 5 "Criteria for use when providing Inmarsat shore-based facilities for use in the GMDSS";
- Resolution A.887(21) "Establishment, Updating and Retrieval of the Information Contained in the Registration Databases for the Global Maritime Distress and Safety System (GMDSS)";
- Resolution A.694(17) "General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigational aids";
- IMO International SafetyNET Manual;
- Resolution A.664(16) "Performance Standards for Enhanced Group Call Equipment"; and
- Appropriate IEC Standards and ITU Recommendations.
(The list will be updated by the Secretariat)

- .2 shore-to-ship distress relay alerts/calls;
- .3 ship-to-shore, shore-to-ship and ship-to-ship search and rescue co-ordinating communications;
- .4 ship-to-shore transmissions of Maritime Safety Information;
- .5 shore-to-ship broadcast of Maritime Safety Information; and
- .5.6 ship-to-shore, shore-to-ship, and ship-to-ship general communications.

3.2 Capacity

The satellite system should be designed for and should provide adequate channel and power capacity for processing effectively, and with an availability as stated in section 3.5, the maritime distress, urgency, safety and general communication traffic estimated to be required by the ships using the system.

3.3 Priority access

3.3.1 ~~Although current systems can recognize more levels, the capability is not implemented in all coast earth stations. In any case,~~

- ~~.2 The satellite system and the coast earth stations~~ Satellite systems in the GMDSS should be capable of processing maritime distress, urgency, safety and routine communications in accordance with the message priority as defined by the ITU Radio Regulations. The order of processing these communications should be:

- .1 distress;
- .2 urgency;
- .3 safety; and
- .4 routine (other general communications).

3.3.2 In implementing these four levels of priority:

- .1 Distress alerts and distress calls (level 1) should be given priority treatment by providing immediate access to satellite channels, and, for store and forward systems, distress alerts and calls should be placed ahead of all routine other traffic. Any system currently being designed for use in the GMDSS after 1 February 1999 should be able to recognize the four levels of priority as described below:

3.3.1.1.2 Mobile satellite communication systems and coast earth stations used for providing other mobile-satellite communications in addition to maritime communications should be capable of automatically recognizing requests for maritime communications from:

- ship earth stations maritime mobile terminals; and

- recognized entities of critical importance for safety at sea, such as MRCCs, hydrographic and meteorological offices, medical centres, etc., registered with the ~~coast~~ earth station.

The system should process such maritime communications in the ship-to-shore and shore-to-ship directions for levels 1 to 3 with priority over other communications.

- .3 In processing maritime distress, urgency, safety and routine communications, the satellite system and the ~~coast~~ earth station should be capable of:
 - .1 automatically recognizing the message or access priority for ship-to-shore communications;
 - .2 automatically recognizing the message or access priority for shore-to-ship communications, **if any are provided**, from, as a minimum, recognized entities of importance for safety at sea, registered by the ~~coast~~ earth station;
 - .3 preserving and transferring the priority;
 - .4 giving distress alerts and distress ~~messages~~ **calls** immediate access, if necessary by pre-emption of ongoing communications of ~~level-4~~ **routine priority**;
 - .5 automatically recognizing maritime distress communications, and of routing automatically maritime distress alerts/~~messages~~ and distress calls directly to ~~the~~ **an** associated MRCC, or responsible RCC, if this capability exists; and
 - .6 processing maritime urgency and safety communications in the ship-to-shore and shore-to-ship directions with ~~adequate~~ **the required** priority, for example by allocating the first vacant channel, if no channel is immediately available; and
- .4 Selection and use of message or access priority for urgency and safety transmissions by ~~ship-earth stations~~ **maritime mobile terminals** should preferably be automatic and should be restricted to calls to special, recognized entities such as medical centres, maritime assistance, hydrographic and meteorological offices, etc., ~~as defined for the coast~~ **registered with the** earth station. The ~~coast~~ earth station should automatically route such calls directly to the relevant entity.

3.4 Coverage area

3.4.1 **The definition of the Coverage Area is given in section 2.**

3.4.2 **The Coverage Area is to be delineated on a map and also described in relation to the sea areas defined in Chapter IV regulation 2 of the SOLAS Convention.** Documentation on the coverage area of the satellite system, as defined in section ~~1.32.2~~, should be forwarded to the Organization.

3.4.3 Information on coverage areas for satellite systems ~~accepted by the Organization~~, as forming part of the GMDSS, should be published by the Organization in the GMDSS Master Plan.

3.5 Availability

3.5.1 The satellite system should provide continuous availability for maritime distress and safety communications in the ship-to-shore and shore-to-ship directions.

3.5.2 The availability of the space segment, provision of spare satellite capacity and the network control function (i.e. the network availability), as defined in section 2.3.1.4 above, should be ~~continuously~~ monitored by IMSO, which should report ~~and reports~~ on the recorded availability of the system ~~should be given~~ to the Organization at least once every year.

3.5.3 Service providers should ~~be obligated to~~ advise the Organization and their associated RCCs and IMSO of planned outages of recognized services and advise ships of scheduled downtime and known interruptions in service and any other relevant network information. Service providers should also advise IMSO of unscheduled interruptions in any recognized services, as soon after the commencement of the interruption as possible, and when the recognized services have been restored.

~~3.6.3.5.4~~ Network availability. The following minimum values of availability are ~~recommended expected for the complete mobile-satellite communication network, including coast earth stations:~~ ~~1 for ship-to-shore distress priority alerts calls:~~ for the recognized services is expected to achieve at least 99.9% availability (equivalent to a total of 8.8 hours down time per year); and

~~.2 — for other maritime communications in ship-to-shore and shore-to-ship directions:~~
99.5% (equivalent to 43.8 hours down time per year).

3.76 Restoration and spare satellites

3.76.1 Spare satellite capacity and arrangements prepared in advance should be provided for ensuring that, in the event of a partial or total satellite failure, ~~restoration of the~~ recognized maritime distress and safety communication services ~~can be restored~~ in the area concerned to their normal availability, within no more than one hour after the event of a satellite failure.

3.76.2 ~~Adequate~~ Full information on the means and arrangements prepared for restoration of the maritime distress and safety communication services in the event of a satellite failure should be notified to ~~the Organization~~ IMSO. IMSO and the Service Provider should conduct exercises from time to time to prove the efficiency and effectiveness of these planned arrangements.

3.87 Identification

The satellite system should be capable of automatically recognizing and preserving the identification of maritime mobile earth stations.

3.98 Information to be made available to SAR authorities

For all distress urgency and safety communications, the ~~Mobile Earth Station I~~ maritime mobile terminal identification Number or Maritime Mobile Service Identity (MMSI) should be an integral part of the distress alert and provided to the RCC with the alert. When available, all additional registration, commissioning or other data relevant to the search and rescue or prosecution of false alert should be referenced to this number and made available to the proper SAR authority or RCC upon request.

3.109 Reception of distress alerts

The satellite system should allow for addressing a maritime distress alert to a specific ~~coast earth station~~ MRCC chosen by the ship's operator and covering the area concerned, but should also provide for automatic routing of manually initiated ~~response to~~ maritime distress alerts ~~even if no specific CES is selected~~. Means should be provided to allow the MRCC to easily identify the system and specific mobile station from which an alert or other priority message has been received, to enable the MRCC to establish shore-to-ship communications with the ship concerned.

3.110 Control of ~~ship earth stations~~ maritime mobile terminals

Access control arrangements for controlling and giving, or temporarily rejecting, access for ~~ship earth stations~~ maritime mobile terminals to the system should at ~~any~~ all times allow ~~ship earth stations~~ maritime mobile terminals access for transmission of maritime distress alerts/calls and distress messages.

3.1211 Test facilities

The system should provide facilities making it possible for ~~ship earth stations~~ maritime mobile terminals to test the distress capability of their stations without initiating a distress alert/call.

4 CRITERIA AND REQUIREMENTS FOR ~~COAST~~ EARTH STATIONS

4.1 Functional requirements

4.1.1 ~~Coast earth~~ Earth stations serving the GMDSS should:

- .1 be in continuous operation;
- .2 be connected to an associated RCC;
- .3 keep continuous watch on all appropriate satellite communication channels; and
- .4 be capable of transmission and reception of at least the ~~following~~ maritime distress and safety communications ~~services included in paragraph 3.1~~:
 - ~~.4.1 ship to shore distress alerts/calls;~~
 - ~~.4.2 shore to ship distress relay alerts/calls;~~

~~.4.3 — ship to shore, ship to ship and shore to ship search and rescue co-ordinating communications;~~

~~.4.4 — ship to shore and shore to ship transmissions of Maritime Safety Information; and~~

~~.4.5 — ship to shore, ship to ship and shore to ship general communications.~~

~~**Note:** Coast eEarth stations operating in the Inmarsat C system should be capable of transmission of Maritime Safety Information in the shore to ship direction via the Inmarsat SafetyNET service.~~

4.2 Priority

4.2.1 The ~~coast~~ earth station should be capable of automatically recognizing the priority of ship-to-shore and shore-to-ship communications, and should preserve the priority and process maritime mobile communications for **with** the ~~following~~ four levels of priority specified in paragraph 3.3.1:

~~.1 — distress;~~

~~.2 — urgency;~~

~~.3 — safety; and~~

~~.4 — other communications.~~

4.2.2 Priority access should be given for distress alerts and calls in real time. ~~Although the current system can recognize more than two levels of priority, the capability is not implemented in all coast earth stations.~~ In any case, distress alerts and calls should be given priority treatment by providing immediate access to satellite channels, and distress alerts and calls for store and forward systems should be placed ahead of all routine traffic. Any **satellite** system ~~currently being~~ designed for use in the GMDSS ~~after 1 February 1999~~ should be able to recognize the four levels of priority and give appropriate access for communications in the ship-to-shore direction and in the shore-to-ship direction for distress, urgency and safety traffic originated by RCCs or other Search and Rescue Authorities.

4.2.3 Limitations in existing public switched networks on facilities for indication and use of priority access codes might necessitate special arrangements such as use of leased lines between, for example, MSI providers and the ~~coast~~ earth station, until such facilities become available in the public switched network.

4.3 Pre-emption

4.3.1 Satellite systems participating in the GMDSS should make arrangements to ensure that it will always be possible for an MRCC to obtain an immediate connection to a maritime mobile terminal on demand. This may be achieved by a process of pre-emption or by other suitable means approved by IMSO.

4.34 Routing of maritime distress alerts

4.34.1 The ~~coast earth station~~ satellite system should have reliable communication links to ~~an~~ one or more associated MRCCs. These links may be implemented directly between the MRCC and an earth station, or some other suitable point in the system's network. The arrangements between the system and the MRCC are subject to approval by the national administration.

4.34.2 The ~~coast earth station~~ system's network should be capable of automatically recognizing maritime distress and safety communications and of routing, as far as possible automatically, the maritime distress alerts/calls directly to the associated MRCC, via a highly reliable communication link. In cases where capability exists, ~~CESs~~ the system may route alerts directly to the responsible RCC as defined in the IAMSAR Manual.

4.34.3 The ~~coast earth station~~ or other relevant part of the system's network should be provided with an aural/ and visual alarm to alert a designated responsible person in the event that ~~appropriate~~ automatic connection to the MRCC cannot be achieved within 60 seconds. In this case, all necessary action should be taken to immediately inform the MRCC of the details of the distress alert or call. Personnel should always be available to react to such an alarm so as to ensure that the distress alert or call can be forwarded to an MRCC within 5 minutes of the alarm being triggered. All messages with distress or urgency priority should sound an alarm at the earth station or other relevant part of the system's network, which should require manual cancellation.

4.34.4 The ~~coast earth station~~ MRCC should be provided with reliable communication links to the MRCC system's network for efficient handling of shore-to-ship distress ~~alert relays alerts~~ and distress traffic, preferably via dedicated communication links.

4.45 Identification

The ~~coast earth station~~ system should be capable of automatically identifying ship earth stations. If another identification than the Maritime Mobile Service Identity (MMSI) is used in the system, a means should ~~shall~~ be provided 24h a day to easily identify the ship ~~by cross referencing to the ship's MMSI number~~, and to provide all the appropriate additional information, including the MMSI number where available, to the MRCC necessary for effecting the rescue.

4.56 Voice communication systems

4.56.1 The communication links for mobile-satellite voice communication systems should be connectable to the public switched network in accordance with relevant ITU-T Recommendations.

4.56.2 ~~Coast earth stations~~ Satellite systems using the public switched network for routing maritime distress alerts/calls and distress traffic to and from ~~its associated~~ MRCCs should, upon receipt of ship-to-shore or shore-to-ship distress alerts/calls or distress traffic, immediately attempt to establish the connection necessary for transfer of the distress alert or distress message.

4.67 Data communication systems

4.67.1 The communication links for mobile-satellite data communication systems should be connectable to the public data communication network in accordance with relevant ITU-T

Recommendations. The system should provide capability for transfer of the identity of the called subscriber to the calling subscriber. Maritime distress alerts/calls and distress messages should include the ship identity and the ~~coast~~ earth station identity or other means of identifying the point of access to the satellite network.

4.67.2 ~~Coast earth stations~~ Satellite systems using the public switched network for routing distress alerts/calls and distress traffic to and from ~~its associated~~ MRCCs should, on receipt of ship-to-shore or shore-to-ship distress alerts/calls or distress traffic, immediately attempt to establish the connection necessary for transfer of the distress alert or distress message.

4.78 Store and forward systems

~~Coast earth stations~~ Satellite systems using for store and forward communication systems should:

- .1 make an initial attempt to deliver a ship-to-shore or shore-to-ship message within 60 seconds for any maritime distress alert or distress traffic, and 10 minutes for all other maritime messages, from the time the receiving station receives the message. The message should include the ship identity and the ~~coast~~ earth station or system identity; and
- .2 generate notification of non-delivery immediately once the message is considered non-deliverable, for maritime distress alerts and distress messages not later than 4 minutes after the reception of the alert or message.

4.89 Facilities for broadcast of Maritime Safety Information

4.89.1 ~~Maritime mobile-s~~ Satellite communication systems forming part of the GMDSS should technically be capable of offering facilities for broadcast of Maritime Safety Information (MSI) ~~by direct printing~~ from MRCCs and authorized providers of MSI, such as Hydrographic Offices and Meteorological Offices, to ships at sea.

4.89.2 Such facilities for broadcast of MSI should provide for automatic, continuous and reliable reception on board ships and should, as a minimum, fulfil the requirements specified in sections 4.9.3 to 4.9.8 below.

4.89.3 The facilities should provide for recognition of and processing the ~~following~~ four levels of priority specified in paragraph 3.3.1:

- ~~.1 — distress;~~
- ~~.2 — urgency;~~
- ~~.3 — safety; and~~
- ~~.4 — other communications.~~

4.89.4 It should be possible to address the broadcast of MSI to all properly equipped ships within a specified area for at least the following types of areas:

- .1 the entire region covered by the satellite or system over which the transmission is made;

- .2 the NAVAREAs/METAREAs as established by the International Maritime Organization (IMO), the International Hydrographic Organization (IHO) and the World Meteorological Organization (WMO) respectively; and
- .3 a temporary area chosen and specified by the originator of the MSI message, including circular or rectangular user-specified areas specifications appropriate for broadcast of distress ~~relay~~ alerts relays and search and rescue co-ordinating communications.

4.89.5 The facilities should provide for transmission of at least the following types of Maritime Safety Information required by SOLAS, as follows:

- .1 search and rescue co-ordination information, including distress ~~relay~~ alerts relays;
- .2 navigational warnings; and
- .3 meteorological warnings and forecasts.

4.89.6 The facilities for broadcast of navigational and meteorological warnings should include possibilities for:

- .1 scheduling the broadcast at fixed times or transmitting messages as unscheduled broadcast transmissions; and
- .2 automatic repetition of the broadcast with time intervals and number of broadcast transmissions as specified by the MSI provider, or until cancelled by the MSI provider.

4.89.7 The facilities should provide for marking MSI messages with a unique identity, making it possible for the shipborne equipment for reception of these broadcasts to automatically ignore messages already received.

4.89.8 The broadcast facilities may service should in addition provide facilities for broadcasts similar to NAVTEX to coastal areas not covered by the International NAVTEX Service, in accordance with the identification system (*i.e.*, the identification characters B1, B2, B3, B4) used in the International NAVTEX Service.

5 ADDITIONAL RECOMMENDED CAPABILITIES

5.1 Mobile-satellite service providers ~~should be~~ are encouraged to:

- 5.1 route Automatic Location Identification (ALI) and Automatic Number Identification (ANI) in accordance with appropriate ITU-T Recommendations with distress calls originating from MSS terminals directly to responsible RCCs for voice and data calls;
- 5.2 automatically route information contained in registration databases in accordance with resolution A.887(21) in a recognizable format with the distress call to the responsible RCC, once means are established for doing so; and

5.3 be capable of retrieving maritime safety information in a timely manner from NAVAREA, METAREA, other relevant co-ordinators, and the International Ice Patrol Service, in a standard format and process established by those co-ordinators; ~~and.~~

~~5.4 broadcast maritime safety information (MSI) in accordance with the relevant provisions of the IMO International SafetyNET Manual.~~

6 NOVEL TECHNIQUES

Satellite systems may be permitted to use novel techniques to provide any of the capabilities required by this resolution. Approval to use such novel techniques for a period of up to 12 months may be given provisionally by IMSO in order to allow early introduction and proper evaluation of the technique. Final recognition of a novel technique may be given by IMSO only after receiving a report allowing full technical and operational evaluation of the technique.

7 LEGACY SERVICES

7.1 All satellite-based systems and services for the GMDSS which were already approved and in use before the entry into force of this resolution are exempt from the requirements of paragraphs 2.1, 2.2 and 2.3. These systems are:

- .1 Inmarsat-A (due to be withdrawn 31 December 2009)
- .2 Inmarsat-B
- .3 Inmarsat-C
- .4 Inmarsat-E 1.6 GHz EPIRBs (due to be withdrawn 30 November 2006)
- .5 COSPAS-SARSAT 406MHz EPIRBs
- .6 The International SafetyNET Service

** see footnote.*

7.2 The services defined in paragraph 7.1 are subject to requirements of paragraph 2.4.

* IMO has decided that Inmarsat Fleet 77 already meets the requirements of Assembly resolution A.888(21) and recommended that Fleet 77 terminals should be used in GMDSS ship installations and by Rescue Coordination Centres.